UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

S
PLANTING
Nurseries, Medicine Bow
(Pole Mountain)

January 5, 1939

ANNUAL NURSERY REPORT

for

1 9 3 8

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ANNUAL NURSERY REPORT

for

1938

POLE MOUNTAIN NURSERY

MEDICINE BOW NATIONAL FOREST

January 1, 1938 to December 31, 1938

Approved

J.S. Veeder Forest Supervisor

Respectfully Submitted

B.J. ABRAHAMS Forest Ranger

INDEX

1. Capacity of Nursery	Page	1
2. Water System		4
3. Seedlings		5
4. Transplants		12
5. Stock Distribution		15
6. Seed Collection and Extraction		20
7. Experiments		21
8. Protection		,25
9. Improvements and Equipement		26
10. Labor		28
11. Costs		29

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Pole Mountain

Pole Mountain Nursery
January 5, 1939.

ANNUAL NURSERY REPORT

POLE MOUNTAIN NURSERY
FOR
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1. Capacity

(a) Area in seedlings, transplants, soiling crops and idle land available for nursery beds:

Species	Area in square feet					
	Seed beds *				Transplants **	
	1-0	2-0	3-0	0-0	2-1	2-2
Pinus Ponderosa	4568	6658		4594	9640 Pole Mt.	4116 Monument
Pinus Contorta	517	528		193	2898 Pole Mt.	
Pseudotsuga Taxifolia	578	792		578	336 Pole Mt.	
Picea Engelmanni	193	264	193	193		289 Pole Mt.
Picea Pungens	193			193	798 Pole Mt.	
J. Scopulorum	386			386	4452 Pole Mt.	
J. Utahensis				193		
Totals	6435	8242	193	6330	18,124	4405

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Square feet in nursery beds	43,536
Square feet in soil crops	62,698
Idle land available for beds	23,960
Total cultivated land	130,194 sq. ft.

* Includes 27¼ % of area for paths, but not roads. (4' beds, 14" paths)
** Includes 9⅓% of area for paths, but not roads. (6' beds, 12" paths and 24" cross paths)

(b) Possible capacity of nursery by class of stock based on present total nursery grounds:

Summary

Area in Acres				Ultimate Production M Plants**			
Unavailable for beds (Lawns - Buildings)	Available for beds* In Use	Idle	Total Area Nursery	Present	Approved	Possible	
8.53	1.21	1.78	11.52	501.4M	280 M	400 M	1-0
				311.2	280 M	400 M	2-0
				14.8			3-0
				345.8	280 M	400 M	2-1
				56.8			2-2
		Total		1230.0M	840 M	1200 M	

* Irrespective of crop rotation. Includes paths but not roads.
** Crop rotation as follows considered:

Seedling Area	Transplant Area
Trees 2 years	TRees 1 year
Soil Crop 1 year	Soil crop 1 season
Fallow 1 year	Fallow over winter

(c) Approved production plan for next 3 years by species and age class of stock.

Species	Age Class	1939	1940	1941
Pinus Ponderosa	2-1	200 M	200 M	200 M
Pinus Contorta	2-1	40 M	40 M	40 M
Pseudotsuga Taxifolia	2-1	40 M	40 M	40 M
Totals *		280 M	280 M	280 M

* This output approved by the Chief in May 1933.

(d) Nursery stock on hand at close of year.

(See Form 132, next page)

Form 132
(Revised July 1, 1912)

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

F.S.
RECEIVED
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TIMBER MANAGEMENT
Ans.

NURSERY STOCK ON HAND

Pole Mountain NURSERY Medicine Bow NATIONAL FOREST September 20 (Date of estimate), 1938

SPECIES	NUMBER OF M.	YEARS IN SEED BED	YEARS IN TRP. BED	SOURCE OF SEED	HEIGHT	CONDITION
Pinus Ponderosa	388.0M	1	0	Pike N.F. Bailey	2 in.	good
Pinus Contorta	39.5			Pole Mountain	1½ in.	good
Pseudotsuga Taxifolia	41.3			Pole Mountain	1½ in.	good
Picea Engelmanni	15.7			Brooklyn Lake Med.Bow	3/4 in.	good
Picea Pungens	16.9			Keystone Med. Bow	3/4 in.	good
Total	501.4	1	0			
Pinus Ponderosa	252.2	2-	0	Pole Mountain	3½ in.	good
Pinus Contorta	24.7			Fox Park Med. Bow	3 in.	good
Pseudotsuga Taxifolia	22.3	1 Held for	3-0	Pole Mountain	4 in.	good
Picea Engelmanni	12.0	" "	3-0	Pole Mountain	2½ in.	good
Total	311.2	2	0			
Picea Engelmanni	14.8	3-	0	Keystone Med. Bow	5½ in.	good
Total	14.8	3	0			
Pinus Ponderosa	185.0	2	1	Pole Mountain	5½ in.	good
Pinus Contorta	55.2			Pole Mountain	6 in.	good
Pseudotsuga Taxifolia	5.9			Pole Mountain	6 in.	Fair
Picea Pungens	15.2			S.French Cr. Med.Bow	5½ in.	good
Scopulorum	84.5			Newcastle, Wyo.	8 in.	good
Total	345.8	2	1			
Pinus Ponderosa	50.8	2	2	Monument, Colo.	8 in.	Fair
Picea Englemanni	6.0			Keystone, Med. Bow	8 in.	good
Total	56.8	2	2			

B.J.ABRAHAMS (Name)

January 5, 1939., 193 (Date of report)

Forest Ranger (Title)

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2. Water System.

(a) Amount of water used, source and method of distribution:

The amount of water used on the trees depended upon the amount of natural precipitation. On the average approximately four hours was considered to be enough on the transplants and 2-0 stock. The 1-0 wtering increased as the season progressed until the trees were hardened off. The most watering of the 1-0 stock was for three hours. Watering during the actual period of development was done every day except as stated above when sufficient precipitation was experienced.

All irrigating was done by overhead sprinklers which are turned by oscillators. This method is very efficient and no difficulty was encountered in supplying the stock with an ample amount of water at all times during the season.

The overhead irrigating system has been completed with the result that all trees can be watered at the same time or by sections. With the new line it is now possible to run all the oscillators simultaneously. Water was practically all secured from the catchment basin below the site of the old pump house. There was plenty of water at all times during the season and the flow varied from 20 to 80 gallons per minute. There is a very striking difference in hardness between the water from this catchment basin and the water from y the spring above the nursery. While no actual test has been made to determine the actual amount of soluble salts present it is felt that a great variation exists as it is quite definitly noticeable in the way soap suds.

(b) How amounts applied and times of watering are determined:

The same method of determining the need for water was used this year as was used last year, namely the use of the surveyors pin augmented by the nurserymans judgement. The uniformity of the growth seems to bear out the need for adopting this method as standard practice at this nursery. Losses were exceptionally low in the transplants (less than 1 %) and it is felt that the method for determining the need for water was in a large way responsible for the low loss.

Watering this year was done for the most part after 4:00 PM, and it was thought that the cold nights might not be helping the night wtering so one section of transplants were watered during the afternoon. At the end of the season no variation could be seen between the trees watered during the afternoon and the trees watered at night. Of course the amounts of water varied as it was found that day watering required approximately 50 % more watering to secure the same amount of penetration and runoff. More work will be done along this line to see if cooling of the soil temperatures is sufficient to deter the growth of both seedlings and transplants.

(c) Recommended changes in system:

No changes are recommended at present in the method of watering.

Section of Seed Bed showing how seed is distributed by the controlled broadcast method.

Section of Seed Bed after germination is completed. Controlled broadcast method was used.

3. Seedlings.

(a) Fertilizing:

Area sown this fall bore field peas summer 1937 and winter rye 1937-38. Area lay fallow summer 1938 prior to fall sowing.

(b) Preperation of seed beds:

Seed beds were sown the early part of October this year as the weather showed signs of early winter.

Seed beds were prepared at the time of sowing with the exception that the area was plowed, disced, harrowed and leveled shortly before. At the time of sowing the area was staked out for the beds which are 4' X 36'. The area was staked out so that three such beds were end to end with a two foot cross path or drainage ditch between them. The staked beds were then covered with sifted soil to a depth of approximately one half inch and then leveled. The beds were then rolled to firm the sifted soil and the beds were ready for sowing. Seeding was done almost entirely with the Planet Junior Drill useing the controlled broadcast method. The only beds not thus sown were the J. Scopulorum whre due to the low germinative force of this seed and the large number per foot that had to be sown the hand broadcast method was used. The seed was then covered with sand by the use of the sanding machine and rolled.

The method of useing 2 X 4's has been found unnecessary when the beds are limited to 36 foot lengths. Shortening of the bed length shortens the distance which water has to run to get out of the beds, thus avoiding the possibility of washing during the period of heavy rain such as was experienced this summer. this is especially true where germination has started and the frames are banked to keep out rodents.

Aluminum Sulphate was used entirely to control damping-off in the fall sown beds and was also used in the spring sown beds this year. Afterseeing the results obtained by the use of this acid in the fall sown beds of last year it was decided to use the same amounts for the various species again this fall. In small check plots, 2 feet by 4 feet, plots having less than 1/2 oz per square foot damped off from 12 % to 31 %. Beds treated with 1/2 oz averaged 6 % loss, and beds treated with 3/4 and 1 oz had a negligible loss. The spruce and fir beds were treated with a full ounce per square foot, and pine beds with 3/4 oz.

(c) Sowing and sowing data.

Spring 1938
(To be transplanted spring 1940)

Species	Method	Date	Oz. Seed per bed	Expect. stand per bed	No. beds	Production Expect	Production Actual
Pinus ponderosa	Control Broad.	6/8	12	5.0 M:	9	45.0M	48.8M
				Total		45.0M	48.8M

Fall 1938
(To be transplanted spring 1941)

Species	Method	Date	Oz. Seed per Frame	Expect. stand per frame	No. frames	Production Expected.
Pinus Ponderosa	Contol Broad	10/5	9 1/3	4.0 M	72	288.0 M
Pinus Contorta	" "	10/7	5	4.0 M	3	12.0 M
Pseudotsuga Tax.	" "	10/7	4	4.0 M	9	36.0 M
Picea Engelmanni	" "	10/7	2 1/3	4.0 M	3	12.0 M
Picea Pungens	" "	10/7	2 2/3	4.0 M	3	12.0 M
J. Scopulorum *	Hand "	10/7	26 1/2	3.5 M	6	21.0 M
J. Utahensis **	" "	10/7	32	3.5 M	3	10.5 M
				Total		391.5 M

* Seed stratified 10 months prior to sowing.
**Seed stratified 9 months prior to sowing.

(d) Table of sowing during 1938.

Species	Source of Seed	Date Sown	Cost per lb.	Germ % force	Total Seed per lb.	Viable Seed per lb.
Pinus Ponderosa	Pike, Bailey	6/8	$ .864	88	13,840	12,179
Pinus Ponderosa	Pike, Bailey	10/5	.864	88	13,480	12,179
Pinus Contorta	Pole Mountain	10/7	3.67	50.5	87,634	44,255
Pseudotsuga Tax.	" "	10/7	2.94	46	46,800	21,528
Picea Engelmanni	Keystone Med. Bow	10/7	3.16	50.5	113,400	57,267
Picea Pungens	" " "	10/7	4.00	80.	106,750	85,400
J. Scopulorum	Pole Mountain	10/7	3.76	6.3	30,237	1,905
J. Utahensis	Dixie N.F. Utah	10/7	1.75	12.4	16,420	2,036

(e) Germination

Species	Date of sowing	Germination per square foot: Expected	After germination	End of season
Pinus Ponderosa	10/25/37	104	110	110
Pinus Contorta	10/28/37	104	103	103
Pseudotsuga Tax.	10/27/37	104	108	108
Picea Engelmanni	10/27/37	104	109	109
Picea Pungens	10/29/37	104	117	117
J. Scopulorum	10/27/37	73	*	7*
Pinus Pondersoa	6/8/38	104	113	113

* No germination until latter part of August. Full germination expected spring 1939.

The above germination figures show that in all cases at least as many seed germinated as were sown for and usually a little more. What was actually sown for was 4.0 M per frame, but a 25% safety margin was used and all of the seed germinated as per the germination tests figure. In other words no loss from rodents, or disease occured between sowing and germination. This is thot to be due to a number of things such as seed of good quality, proper acid treatment at time of sowing and carefull attention to rodent protection. This fall the same seed and treatment were given the beds and if the results are as good next spring after germination it would seem to indicate that the sowing of seed with good vitality is necessary to proper germination. The acid treatment was also a factor in proper germination as it has been found that a sort of preemergence damping off destroys the seed prior to the actual germination. This was found to be true again this year in the check plots.

(f) Shading.

All 1-0 seedlings were shaded until germination was complete and then were uncovered except for what shade was supplied by screens. The spruce and fir beds were shaded all season. It is thot that perhaps the lodgepole pine beds would do better to leave the shade on all season, and this will be tried next year with part of the trees to check any possible variation in developement. In the 2-0 beds no shade was given the trees with the exception of the fir and spruce. The latter species were shaded all season. In the 3-0 Engelman spruce beds no shade was applied during the entire season. In speaking of no shade it is meant that only screen is above the trees and the screen does afford a light shade.

(g) Watering.

All watering was done with the overhead sprinkler system. Prior to actual germination of spring sown beds watering was limited to one hour in the morning and one hour in the evening. Fall sown beds were not watered prior to germination as enough moisture was present in the ground. After germination had started the water was left on for a longer period, and after germination was complete all 1-0 beds were given three hours watering dailey, usually in the evening. The 2-0 beds were given four hours watering daily as a usual thing except that no watering was done if precipitation of .2 inches or more was enjoyed.

(h) Cultivating.

No cultivating of seedlings is done at this nursery.

(i) Root Pruning.

Root pruning has not been the practice at Pole Mountain in the past and none was attempted this year. However it is planned to secure a seedling digger and root pruner, and then root pruning will be limited to pruning the seedlings at the time they are lifted for transplanting. It is felt that this will tend to produce stock with a more fibrous root system.

(j) Weeding.

Weeding was more of a problem this season than in the past. This was no doubt due in a large way to the excessive precipitation. It was necessary to keep two CCC enrollees on the weeding job all season. It is felt that a good job of weeding and general maintenance was done by these two men. It was thot that the weeding could be done by having five or six men do the weeding and thus get the beds cleaned quicker, but it took so much bossing that the idea was soon aboandoned for the system of keeping a few men at it continuously. A final weeding was given the 1-0 beds just prior to putting on the winter protection. All other beds were left as it was felt that it was not necessary to weed them as they would allbe dug next spring.

(k) Mulching.

All fall sown seed beds were covered with a four inch layer of pine needle mulch immediately after sowing. The mulch was gathered prior to the fall work schedule and was on hand as needed. The mulch is applied directly to the beds and acts as a rodent protection as well as a ground protection. There was no sign of any rodents getting into the beds. The mulch is not taken off in the spring until definite signs of germination are detected. In the 1-0 and 2-0 beds only the fir and spruce species are mulched. In the 1-0 the mulch is put directly on the trees while in the 2-0 the mulch is placed over slatting which is supported by 2 X 6's. Other trees in the 1-0 beds are protected by protective frames which break the wind and act as snow catchers which same acts as an excellent mulch. In the 2-0 beds the same protective frames are used with the additional raising of the frames on 2 X 4's so that no part of the frame contacts the needles.

(l) Size and developement of seedlings by species and age classes.

See Form 132, page 3 of this report.

(m) Injuries and their treatment.

1. Frost. No losses from frost occured this year and no damage from frost during the spring, such as was experienced last year, occured. Frost covers were used twice during the spring when there was an indication that a drop in the temperature severe enough to cause injury was coming.

2. Disease. Damping off this year was negligible in the 1-0 beds and it is felt that the present treatment was responsible for the small loss as shown by the check plots. The same treatment will be continued until a need for another kind of treatment is indicated.

Root rot in the 2-0 beds was confined principally to the lodgepole pine beds. While the loss is not severe there is a noticeable amount. It is thot that this was a carry over from the first year. No root rot is expected in the 1-0 beds which will be 2-0 next year as a larger amount of acid was used and there is no sign at present that would indicate that we should expect any. We hope.

3. Mice and other rodents. Mice and other rodents were well under control

The past year and this was no doubt due to the liberal use of poison and traps. Poison is the principal deterent. It was necessary from time to time to carry on a ground squirrel eradication program as these pests became quite a nuisance around the nursery. The damage done by these pests was very light being limited to a hole in one of the 3-0 spruce beds. The pest was flooded out of the hole and killed. The body was then impregnated with strychnine and left for a bait.

(n) Losses and excess germination and their effects on the production schedule, and planting plans.

The production of 1-0 seedlings is well above the authorized production for this nursery and this is due to the fact that practically every seed sown germinated. This is not a serious thing as in the event that no more than the authorized number is wanted it will give us a chance to select only the best. at present they are all best. The number of 1-0 ssedling stock on hand should be able to give us a production of approximately 400 to 450 M trees for field planting in the spring of 1941. These figures are based on a 5 to 10 % loss each year of the seedlings life in the nursery which is above the figure for the last two years.

The 2-0 stock on hand is enough to produce the authorized output of transplants in 1940 even if a 10% loss occurs next year which it will not unless an unforseen catastrophy occurs. The loss in the 2-0 beds as shown by the fall inventory was approximately 4%. The largest loss having occured in the lodgepole pine beds due to root rot.

Losses in the transplant beds will be discussed under transplants.

Probable production and deficit of transplant stock in 1940

Present age class	Species	Quantity on hand	Expect. loss	Probable product. M	Quantity desired M	Deficit M	Excess M
2-0	Pinus Ponderosa	252.2	10%	227.0	226.0		1.0
"	Pinus Contorta	24.7	"	22.3	22.0		.3
"	Picea Engelmanni	12.0 *					
"	Pseudotsuga Tax.	22.3**	10%	20.1	20.0		.1
3-0	Picea Engelmanni	14.8***	10%	13.4	12.0		1.4
	Total	314.0M		282.8M	280.0M		2.8M

* To be held over and produced as 3-1 stock.
** To be produced as 3-0 stock.
*** Will be transplanted and produced as 3-1 stock.

See transplants for further details on stock being held over.

Probable production and deficit
of
transplant stock in 1941

Present age class	Species	Quantity on hand	Expect loss %	Probable Production M	Quantity desired M	Deficit M	Excess M
1-0	Pinus Ponderosa	388.0	10	350.0	220.0		130.0
	Pinus Contorta	39.5	10	35.0	30.0		5.0
	Pseudotsuga Tax.	41.3	10	37.0	30.0		7.0
	Picea Pungens	16.9	10	15.0			15.0
	Picea Engelmanni	* 15.7					
2-0	Picea Engelmanni	** 12.0	10	10.0			10.0
	Total	497.7		447.0	280.0		167.0

* To be held for the production of 3-1 stock, for field planting 1942.
** To be held for the production of 3-1 stock, for field planting 1941.

(o) Recommended changes in seedling culture.

Since the changes recommended last year have all been carried out again this year and found to bear out the facts as found last year, the practices of seedling culture will henceforth be carried out along these lines. These changes for the most part consist of the following:

1. Bed length limited to 36 foot sections.
2. Winter protection for the pines to consist of frames supported on 2 X 4's and slatting rolled out over the frames. The end of the bed on the side of the prevailing wind to be closed off with a piece of 1 X 8 and the other end to be left open for drainage.
3. Mulching of the 1-0 fir and spruce beds to be done by applying the pine needle mulch directly on the trees. 2-0 Spruce and fir will be mulched by putting the mulch on slatting supported by 2 X 6's.
4. All seed sowing to be done by the controlled broadcast method useing the drill.
5. The use of Aluminum Sulphate for the contol of damping off.

(p) Sowing schedule for the coming year.

Fall sowing schedule for 1938 was done as a complete sowing to produce the authorized output.

Spring sowing will be limited to making up for losses due to poor germination or to rodent damage.

Sowing schedules follow:

Fall sowing schedule for 1938.

Species	Number of beds of 4 M each	Seedling yield M	To produce M transplants
Pinus Ponderosa	72	288.0	200.0
Pinus Contorta	3	12.0	10.0
Pseudotsuga Tax.	9	36.0	30.0
Picea Pungens	3	12.0	10.0
Picea Engelmanni	3	12.0	10.0
J. Scopulorum	6	21.0	16.0
J. Utahensis	3	10.5	8.0
Total	99	391.5	384.0

No planned schedule for spring 1939.
Will be limited to taking care of unexpected losses.

Sowing schedule for fall 1939 and spring 1940.

No changes in the sowing schedule contemplated although some variation as to amounts of certain species may be made.

Fall Sowing scenes at Pole Mountain

Showing

Bed preperation, seed sowing and bed covering.

4. Transplants.

(a) Fertilizing.

Aside from soiling crops such as field peas and winter rye grown on the areas, the transplants receive no fertilizer.

(b) Preperation of transplant area.

As early in the spring as possible the area is plowed, disced and floated, and made as near level as practicable.

(c) Method of transplanting.

The area to be transplanted in is staked as soon as the ground is properly prepared. Beds are laid out 6' X 36' and three such beds witha one foot path between each are staked on each side of the overhead sprinkler lines. Tapes are stretched as guides having alternate copper and brass markers every six inches. The Yale transplant board is used and trenches are made with a steel hand trencher. The transplant crew consists of five men as follows:

2 Threaders
1 Trencher
1 Boardman
1 Tender

(d) Watering.

Transplants are watered as soon as possible after transplanting so that the trees cannot become dry. A hand hose is used to water the trees close behind the last row of trees planted, and as soon as a section is planted the overhead line is installed and the trees given a good watering. Watering during the season depends on the need for water as indicated by the use of the surveyors pin. This method of testing the soil for available moisture has been used very successfully and will be adopted as standard practice.

(e) Cultivation.

Transplants are not cultivated as a sufficiently large top is secured as it is.

(f) Root pruning.

No root pruning of transplants is done at the Pole Mountain Nursery.

(g) Weeding.

Weeding is all done by hand as required. This year it was necessary to weed the beds quite often as sufficient labor to weed the beds periodically was not available. The weed problem this season was mostly due to small weeds of a creeper type. These weeds required more time to pull than the larger ones, and grass was also a factor. However the weeds were at no time of such density to be cause for anxiety.

(h) Mulching.

Mulching of transplants was limited to the spruce and fir species. The mulch is placed on slatting supported by 2 X 8's and the beds thus are completely enclosed. The pine needle mulch is applied to a depth of four inches. the mulch is kept moist so that it freezes. This prevents the mulch from being diturbed by wind and also prevents any sudden changes in temperature. All other species are protected by slatting supported by 2 X 8's. The end of the beds toward the prevailing wind is closed off whilt the other end is left open for drainage.

(i) Size and developement of transplants by species and age class.

See Form 132, Nursery Stock on Hand, pg 3 of this report.

(j) Density at time of transplanting and at time of inventory at end of season.

Species	Source	At time of transplanting per sq.ft.	At close of season per sq.ft.	% loss
Pinus Ponderosa	Monument, Pike	13.00 *	12.95	0.4
Pinus Ponderosa	Pole Mountain	20.60	20.32	1.3
Pinus Contorta	" "	20.60	20.52	0.4
Pseudotsuga Tax.	" "	20.60	19.00	7.8
Picea Pungens	" "	20.60	20.60	0.0
Picea Engelmanni	" "	20.40 *	20.60	0.0
J. Scopulorum	" "	20.60	20.60	0.0
Average (Weighted)		19.63	19.46	0.84

* These figures are for density at beginning of second transplant year.

(k) Injuries and their treatment.

As can be seen from the above table very little loss occured in the transplant stock this season. In the douglas fir root rot evidently carried over from the seed ling stage and in this species the heaviest loss occured. The loss in no way interferes with the planting schedule as there were very few of these trees to begin with. The ponderosa pine while no heavy loss was suffered show a slight yellow coloring. This is thot to be due to the fact the area in which the transplants are has been used two years running. The poor color is by no means any indication that the stock has sufferd as the root developement is a very good indication that the trees are of good quality. No damage from frost occured this year.

(l) Losses and their effect on the production schedule and planting plans.

As the figures on Form 132 show the production is well ahead of the authorized output, and this increases the number of trees available for field planting. On the basis of authorized production there is an overage of 65.8 M 2-1 stock and 56.8 M 2-2 Stock. This is the first time in the history of the Pole Mountain Nursery that the actual production has been above the authorized number. At present the indications are that the authorized output will be maintained in the future. If all the transplant stock is to be planted on the Pole Mountain Project it will mean a planting job of approximately 671 acres or 221 acres more than was planned. This is not detrimental to the plan, but a matter of finances to do the work.

(m) Recommended changes in transplant culture.

It is again recommended that this nursery be equipped with a tree digger in order that less damage at the time of digging the seedlings for transplanting result. There is always some damage from digging seedlings with the use of hand tools, and this would be overcome to a large degree by the use of a tree digger. The fibrous roots would not get torn as much and better transplant stock should result. Economy of operation would also be a factor as hand digging is time consuming. The digger is asked to dig only trees for transplanting at the nursery. It would be nice to have a digger for the transplants also, but the present need is for a seedling digger.

The method of placing the trees directly in the boxes as they are dug was used again this year, and has been adopted as standard practice . The trees are placed between layers of wet burlap and thus are kept moist at all times. A layer of wet moss is placed on top of each box of trees.

(n) Table of stock transplanted in spring 1938.

Species	Quantity	Age Class	Nursery from which obtained
Pinus Ponderosa	187.4	2-0	Pole Mountain
Pinus Contorta	55.4	2-0	" "
Pseudotsuga Tax.	6.4	2-0	" "
Picea Pungens	15.2	2-0	" "
J. Scopulorum	84.5	2-0	" "
Total	348.9 M		

(o) Table of stock to be transplanted spring 1939.

Species	Quantity	Age Class	Nursery from which obtained
Pinus Ponderosa	252.2	2-0	Pole Mountain
Pinus Contorta	24.7	2-0	" "
Picea Engelmanni	14.8	3-0	" "
Total	291.7 M		

5. Stock Distribution.

(a) Lifting.

Lifting was done this year by hand as in the past. It has been felt that the number of trees produced did not warrant a tree digger. However the number of trees to be dug next spring would be done much more efficiently if we had a digger.

(b) Culling, counting and bunching.

Trees were not culled at the nursery except for dead trees being taken out. Trees are not culled for size. Culling for poor roots is done on the planting job. Trees were dug with spades by CCC enrollees under constant supervision of a foreman. If the men were not watched there was a tendency to jerk the trees and strip the roots. Very little of this occured and the trees arrived on the job in excellent condition. The trees were not bundled at the nursery, but were placed in the Nebraska packing boxes in layers and moss placed over each layer. Counting was done by taking the inventory counts for the beds. This method is very much simpler than bunching the trees and the trees are not exposed while counting the bunches. As described in the Annual Planting Report, the trees are bundled on the job by the water boy and the men are given a bundle of trees all wrapped in burlap. Trees were dug one day and sent to the field the next day. Sometimes trees dug in the morning were delivered to the field the same afternoon.

Where trees were shipped to other agencies all trees were hand counted and culled. The trees were placed in carriers and were kept covered with wet moss until they were ready for shipment. Trees were counted in bunches of 50 and thus a careful count was made. Trees were bundled in waterproofed burlap and shipped by express the same day. No complaints were received of trees arriving in poor condition or of poor counts.

(c) Packing.

Trees for the Pole Mountain Project were all packed in the Nebraska type boxes. The boxes were lined with waterproofed burlap and a layer of wet moss was placed on the bottom. Approximately 500 trees were placed in each layer and another layer of wet moss on top.

Trees being shipped by express are placed in waterproofed burlap and the entire package supported with 1 X 4's. The trees are so packed that the entire tree is protected.

(d) Shipping.

Trees were trucked directly to the planting job.

(e) Recommended changes in distribution.

No changes from the above described method is recommended at this time.

(f) Ta ble of nursery stock distributed spring 1938.

See Form 150, next page.

(g) Table of nursery stock distributed fall 1938.

No fall distribution.

(h) Table of nursery stock available for distribition spring 1939.

See Form 150, next page.

(i) Table of stock available for distribution fall 1939.

No fall distribution contemplated.

Form 150
(Revised July 1, 1912)

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

NURSERY STOCK DISTRIBUTED

Pole Mountain Nursery Medicine Bow National Forest Spring (Season), 1938

FOREST SENT TO	NUMBER OF M	SPECIES	YEARS IN SEED BED	YEARS IN TRANSPLANT BED	SOURCE OF SEED	COST PER M STOCK	COST PER M STOCK DISTRIBUTION	COST PER M TOTAL
Medicine Bow								
Pole Mt. Project	154.9	Pinus Ponderosa	2	1	Pole Mountain	16.24	1.00	17.24
	32.5	Pinus Contorta	2	1	" "	17.02	1.00	18.02
	33.0	Pseudotsuga Tax.	2	1	S.French Cr.Med.B.	17.30	1.00	18.30
Soil Cons. Serv.	W.P.D.							
Lander, Wyo.	3.5	Picea Pungens	2	1	S.French Cr. Med.B.	17.90	1.10	19.00
Torrington, Wyo.	1.5	" , "	2	1	" " " "	17.90	1.10	19.00
Clark-McNary								
Lake Andes, S.D.	.4	Picea Pungens	2	1	S.French Cr.Med.B.	17.90	1.10	19.00
Webster, S.D.	.5	" "	2	1	" " " "	17.90	1.10	19.00
Milbank, S.D.	.7	" "	2	1	" " " "	17.90	1.10	19.00
Sioux Falls, S.D.	1.2	" "	2	1	" " " "	17.90	1.10	19.00
Brookings, S.D,	1.7	" "	2	1	" " " "	17.90	1.10	19.00
Total	229.9 ✓							

B.J.ABRAHAMS (Name)

Jan. 5, 1939. (Date of report), 193

Forest Ranger (Title)

U.S. GOVERNMENT PRINTING OFFICE 8—9054

Form 150
(Revised July 1, 1912)

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

NURSERY STOCK DISTRIBUTED

Pole Mountain Nursery Medicine Bow National Forest Spring (Season), 1939

FOREST SENT TO	NUMBER OF M	SPECIES	YEARS IN SEED BED	YEARS IN TRANSPLANT BED	SOURCE OF SEED	COST PER M STOCK	COST PER M STOCK DISTRIBUTION *	COST PER M TOTAL
	50.8	Pinus Ponderosa	2	2	Bailey, Pike	10.93	.80	11.73
	185.0	Pinus Ponderosa	2	1	Pole Mountain	12.43	.80	13.23
	55.2	Pinus Contorta	2	1	" "	11.94	.80	12.74
	84.5	J. Scopulorum	2	1	Newcastle, Wyo.	11.71	.80	12.51
	15.2	Picea Pungens	2	1	S.French Cr.Med.B.	11.76	.80	12.56
	6.0	Picea Engelmanni	2	2	Keystone, Med.B.	16.21	.80	17.01
	5.9	Pseudotsuga Tax.	2	1	S.French Cr. Med.B	21.86	.80	22.66
Total	402.6							

* Based on cost of distribution to Pole Mountain Project.
For shipment elsewhere add $0.58 per M.

B.J.ABRAHAMS
(Name)

Jan.5, 1939, 193
(Date of report)

Forest Ranger
(Title)

U.S. GOVERNMENT PRINTING OFFICE 8—9054

(j) Summary of stock ditributed spring 1938.

Species	M Plants				
	Forest Service		Cooperative		
	Seedlings	Transplants	Seedlings	Transplants	Total
Pinus Ponderosa	0	154.9	0	0	154.9
Pinus Contorta	0	32.5	0	0	32.5
Pseudotsuga Tax.	0	33.0	0	0	33.0
Picea Pungens	0	0.0	0	9.5	9.5
Total	0	220.4	0	9.5	229.9

(k) Summary of stock available for distribution spring 1939.

Species	M Plants				
	Forest Service		Cooperative *		
	Seedlings	Transplants	Seedlings	Transplants	Total
Pinus Ponderosa	0	235.8	0	0	235.8 **
Pinus Contorta	0	55.2	0	0	55.2
J. Scopulorum	0	84.5	0	0	84.5
Picea Pungens	0	15.2	0	0	15.2
Picea Engelmanni	0	6.0	0	0	6.0
Pseudotsuga Tax.	0	5.9	0	0	5.9
Total	0	402.6	0	0	402.6

* None contemplated at present.

** Includes all transplants.

6. Seed collection and extraction.

(a) Collection, extraction and costs.

Species	No. Bu. Collected	Cost per Bu.	Lbs. of clean seed per Bu.	Cost of Seed Extraction: Per Bu.	Cost of Seed Extraction: Per Lb.	Total Cost clean seed per Lb.
Pinus Ponderosa	100 *	$ 2.93	1 lb. 14oz.	$0.85	$0.45	$2.00
Pinus Ponderosa						1.37 **
J. Utahensis	24 Lbs.	.36	4oz.	.08	.32	1.76 ***
Picea Pungens	1½	2.50	2/3 lb.	.20	.30	4.05

* Collected by CCC Laramie Peak 1938.
** Seed collected Black Hills N.F. extracted Harney N.F. 1937 crop.
***Collected Dixie N.F. extracted Pole Mt. Nursery. 1937 crop.

(b) Inventory of seed.

Species	Total seed received during year	Total amount on hand	Year collected	Amount needed during year: spring 1939	Amount needed during year: fall 1939	Source
Pinus Ponderosa	189 lbs.	189 Lb	1938	*	40lb	Laramie Pk. Med.Bow
Pinus Ponderosa	69½ "	69½ "	1937			Black Hills N.F.
Pinus Ponderosa		13 "	1935		13 "	Bailey, Pike N.F.
Pinus Ponderosa		35 "	1935			Pole Mt.Med.Bow.
Pinus Contorta		12 Lb	1937		1 "	Keystone, Med.Bow
Pinus Contorta		10 oz	1936		10oz	Pole Mt.Med.Bow
Picea Pungens		1 Lb	1934		8oz	S.French Cr.Med.Bow
Picea Pungens	1 lb.	8 oz	1938			Keystone, Med.Bow
Picea Engelmanni		16 5/8	1937			Keystone, Med.Bow
Picea Engelmanni		28 Lbs	1936		8oz	Snowy Range,Med.Bow
Pseudotsuga Tax.		1 3/8	1936		2lb	Pole Mt. Med.Bow
J. Scopulorum		4 1/8	1937		4lb	Pole Mt.Med.Bow

* None contemplated.

7. Experiments.

(a) Completed during the year.

1. The virility of seed collected the latter part of August as compared with seed collected September 10 to 30.

This experiment has been conducted since last year. It was undertaken to determine if the trouble experienced at this nursery in past yaers with delayed germination might not in some way be due to the use of seed collected too early in the season. The experiment was carried out with seed already on hand collected the latter part of August 1936, some seed collected August 29, and some seed collected September 12,1937. The species used was pinus ponderosa from Pole Mt. Germination teste were made of 200 seed of each lot just prior to sowing. The experiment was carried on in both fall sown and spring sown beds. The seedcwas accorded the same treatment and it seems to be quite conclusive that seed gathered in August loses its virility rapidly and is the primary cause of delayed germination at this nursery. The results were as follows:

Fall Sowing

Date collected	Germ. % by test	Date sown	Date of first germinat.	Germination per sq. ft. 10 days	20 days	30 days	final end season
8/29/37	72	10/28/37	June 4	12	41	56	81
8/29/36	28	10/28/37	June 9	7	36	47	73
9/12/37	74	10/28/37	June 3	39	78	101	103

Spring Sowing

8/29/37	68	6/8/38	June 27	23	52	58	90
8/29/36	21	6/8/38	June 30	14	40	49	76
9/12/37	73	6/8/38	June 24	32	71	104	104

The number sown for was approximately 5 M per frame or 104 per sq. ft.

There is about two weeks difference in the date of collecting, but it is evident that this two weeks is vital to the production of seed that will be capable to hold up and have strength enough to germinate properly.

2. Shading of 1-0 seed beds. An experiment to determine if shading the seedlings for different lengths of time following germination effected the developemnt of the seedlings.

This experiment was conducted by the use of slatting rolled out on the protective frames. The shade was approximately 40 % and the the species experimented on was pinus ponderosa from the same seed lot and sown the same date.

2. Continued

The following is a comparison of the beds on which the experiment was carried out:

Frame No.	40% Shaded days	Germination days 10	20	30	Final	Effect on developement End of season * Height in inches
1	15	28	73	101	105	1 8/16
2	30	26	80	102	108	1 14/16
3	60	26	81	104	107	2 3/16

* Determined by measuring 100 trees in each frame.

There doesn't seem to be enough difference in germination to determine any real benefit between the various shadings. However, in the final developem ment at the end of the season there is a decided variation in growth and is very noticable between the two extremes. Evidently the shading has a tendency to keep the night temperatures from droping as much as without shading and it is this fact that influences the developement. This experiment will be carried out again next year on a larger scale.

3. Night watering versus day watering of transplant beds.

This experiment was carried out to determine if a desireable effect was obtained from watering the transplant beds at night or during the day. In this experiment beds were watered in the afternoon and in the evening hours. At the end of the season no appreciable difference in growth could be noticed and it is planned to carry on this experiment another year.

4. The method of protection for the pines by the raising of the frames on 2 X 4's was again a successful way to prevent windburning of the needles. No further experimenting with these species is felt necessary and the system has been adopted as standard practise.

5. To determine if the use of 2 X 4 sides are necessary to proper drainage of seedling beds in order to prevent the formation of ice.

This experiment was carried out by making beds 36 feet long instead of making the beds continuous for 120 feet. The long beds had the 2 X 4's and the short beds did not. This experiment has been watched now for two years, and both times the beds with the 2 X 4's were found to have more ice than the beds without. This it was found was due to the fact that the 2 X 4's would raise when the ground was frozen and thus the water could not drain off and ice resulted from freezing. If the nurseryman is careful and keeps the drainage ditches open there is very little danger of the beds suffering from ice damage.

(b) Proposed

1. To determine if it would be feasible to drill seed in beds that have had a sand cover applied beforehand. If this can be done with just as good results it would save much time and labor in the prepration of seed beds.

2. An experiment will be undertaken next fall with the view to finding out if the digging of the transplant stock in the fall and healing in of the stock at the nursery will be a better method than waiting until spring to do the digging. The experiment is to be undertaken because digging in the spring is often very difficult due to the uneven thawing of the area. At times this means that digging is a matter of testing the area to see where trees can be dug. The experiment will be tried on a small scale in order to determine the best methods of healing in and protection. Costs will also be kept to see if there is any variation in the cost of distribution.

3. Watering, Day versus night watering will be tried again next year as nothing conclusive was discovered this season. Various periods of watering are to be tried both in the night and the day watering. This experiment will also be extended to include seedling beds of different ages.

(c) Weather Data.

The weather records for the Pole Mountain Nursery have been kept for a period of eight years and as this is less than the time for which the weather bureau determines an average the present year is compared with the average for the seven preceding years.

In analyzing the data for the past seven years it is noted that no two tears in succession are very close. This may be due to the fact that the period for which the records have been kept were not average years due to years of severe drouth. It may be necessary to have data for a longer period than the usual ten years before a real average can be properly determined. It is a well known fact that the water table in this area is not a dependable one, and this was brought out during the dry years. Springs that ordinarily have a good flow all year dried up completely, while springs that usually dried up late in the summer ran all year.

As for temperatures, the only thing that can be said is that temperaturse above the eighties are rare, and that freezing temperatures may be expected almost any time of year. As an average the mean temperatures do not seem to vary very much one way or the other from year to year.

For table on temperature and precipitation see next page.

POLE MOUNTAIN WEATHER DATA
1938

Data taken from U.S. Weather Bureau publication Climatological Data.

Month	Temperature Data				Precipitation (inches)	
	Mean Max.	Mean Min.	Mean Temp.	Departure From Normal *	1938	Departure from Normal*
December**	29.6	13.7	21.6	-2.6	1.84	1.25
January	28.6	9.2	18.9	.4	.82	.09
February	29.4	12.5	21.0	1.3	.56	-.28
March	34.6	16.5	25.6	.6	1.84	.67
April	43.4	21.6	32.5	* .3	3.43	.76
May	50.5	29.4	40.0	-2.1	2.70	-.07
June	65.8	38.7	52.2	- .5	3.32	1.99
July	71.0	42.4	56.7	-4.1	2.65	.83
August	72.2	44.0	58.1	- .5	2.32	.85
September	63.3	38.9	51.1	.8	2.21	1.18
Octpber	52.9	30.2	41.6	1.4	.95	.35
November	28.4	11.2	19.8	-8.7	1.09	.60
				Total Precipitation for Year	23.73	
				Excess or deficiency		8.22

* No Normal figures established for Pole Mt., Figures used are for previous seven years.
** December 1937 figure, figures for 1938 not available at this time.

From the above table it can be seen that the precipitation was far in excess of the "Normal". While the amount is not an excessive figure yet the rains during the season were sometimes of cloudburst proportions, and while no damage resulted to stock at the nursery trees in the field suffered from the resulting washes.

8. Protection.

(a) Rodents.

Mice. No damage from mice was found this year. Seed beds sown in the fall had no fail spots due to mice. It is felt that mice can be satisfactorily controlled by the diligent use of poison and proper protection for the seed before and after germination.

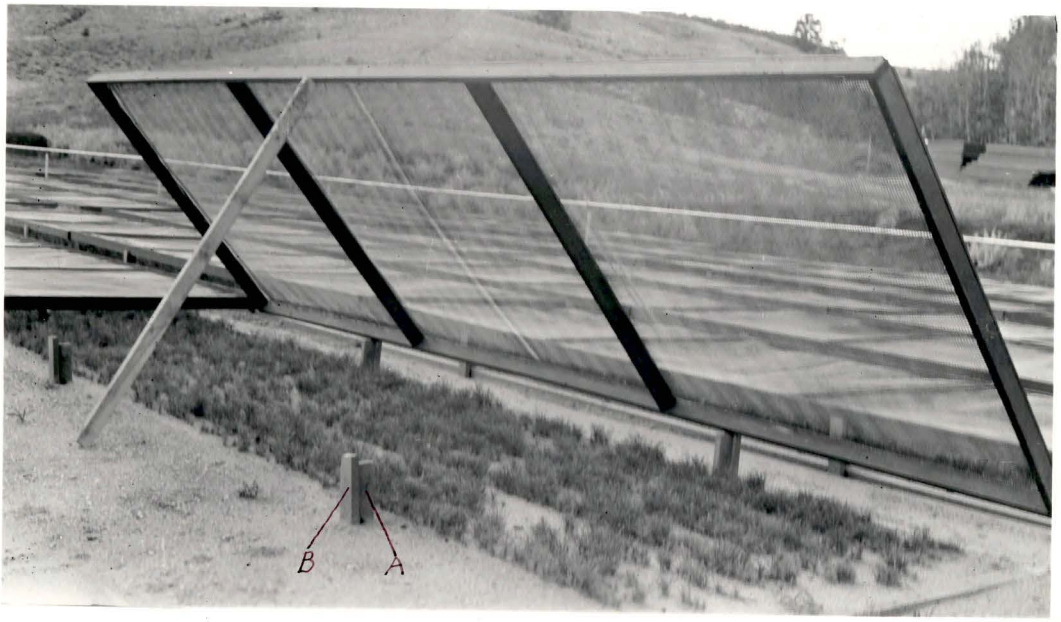
Ground Squirrels. This rodent is quite a problem at the nursery, not because he does any particular damage to beds, but more from the holes that they make in the idle areas and adjacent to the nursery. Only one hole was found in a bed, and this was flooded and the victim drowned. Control was not limited to any one method. Poison, shooting, and flooding were all tried to control this varmint. The difficult part of trying to control this creature is that the surrounding country is so full of them. For poison a number of methods were tried with varying success. Poison oats were put in the holes but very little effect was seen on the population. An excellent method was found to controll local areas by shooting one of them and spreading strychnine over it without handling the bait. Toward the end of the season some Castor Beans were secured and one or two of these were put in a hole. Due to the fact that the season was on the wane no definite conclusions could be accepted although a lessening of the varmints was noticed around the nursery.

Rabbits. This particular pest is very abundant all over the district and it may be a good idea to import some coyotes to try to control them with. As far as damage from rabbits at the nursery very little occurs. Some of the damage noted was the same kind as done in the plantations, namely the tops were nipped off. No damage to seed beds from rabbits getting in has been found so far. Rabbits do not seem to take readily to poison and shooting is about the only means of control.

(b) Other protection.

Protection is necessary at this nursery from hail. This protection consists of screens being placed over the beds in which seedlings are being grown. Transpalants have been found to be able to withstand hail due to the fact that the density of the stand is not very great as compared with the seed beds.

A new type hail frame was developed and tried this year and with excellent results. The frame is 4' X 12' and is made of 1 X 2 material covered with $\frac{1}{4}$ inch wire screen. These frames are supported above the trees by means of 4 wooden stakes of special design. This frame is so light and easy to handle that one man can weed a bed instead of requiring two men to do so as the use of the regular rodent screen required. It would no doubt be more economical to make the supports of metal as they would last almost indefinitly whereas the wooden stakes will probably have to be replaced every other year. These frames take up very little storage space as they can be stored by placing them on edge. One hundred of these frames can be stored in a space 12 feet by 24 feet.



New type hail protection screen and supports 1938

A - Frame rests on this part of support.

B - Frame held in place by this part.

9. Improvements and Equipement.

(a) Equipement purchased and constructed 1938.

1. Equipement purchased consisted of slatting for winter protection, overhead sprinkler line and supports, and oscillators.

There is now sufficient slatting on hand to take care of a 400 M annual output schedule. It was necessary to purchase sufficient overhead sprinkler line to take care of some replacements due to poor watering being done by some of the line which was on hand. This old line was made up locally and the holes did not line up causing some parts of the beds to receive more water than other parts. There is now sufficient new and old overhead to take care of a 400 M annual output schedule. Three new oscillators were purchased at the beginning of the year and the nursery is now equiped to properly take care of all necessary watering for the amount of overhead sprinkler line on hand.

2. The necessary risers to supply the sprikler lines were installed prior to the spring work and the beds can now be laid out on a permanent basis. Three risers were installed in the transplant area, and four in the seed bed area. These risers were so constructed that each one is capable of supplying sufficient water to operate two lines if necessary.

3. Prior to the uncovering of the fall sown beds this spring 120 new protective frames were constructed from materials on hand. The only cash layout for these frames was for labor which came to 75¢ per frame. These frames are very much superior to the old frames and is no doubt responsible for the effective control of rodents.

4. Materials were purchased and 10 new Nebraska type shipping boxes were constructed. We now have sufficient boxes to take care of distribution to the Pole Mt. Project.

5. It is planned to construct another baler this winter as it is expected that shipments to other forests are likely to increase in the future.

(b) Comments on new developements, uses, and future needs.

The following improvements and equipement are felt to be needed at the Pole Mountain Nursery.

1. A tree digger for the seedlings is a very much needed piece of equipement. If at all possible one should be secured in time for the spring transplanting. As there are no facilities for constructing one on this forest it is suggested that one be constructed either at one of the other nurseries in the region or in Denver.

2. Tractor. There is a pressing need for a tractor to do the necessary farming, preperation of beds, and to act as a power unit for the digger. At present we are trying to do this work with a John Deere but it is not at all satisfactory. When trying to level the areas the ground becomes hard packed

from running the John Deere over the area and it is then necessary to loosen the ground by hand. It is felt that all of the necessary work could be accomplished in a satisfactory manner with a 20 caterpillar tractor equiped with a windlass for pulling the digger.

3. Digger for transplants. This digger is not as necessary as the seedling digger at present as hand digging while slow is not damageing to the stock as hand digging in seed beds is due to the difference in the density. This digger could no doubt be made up at one of the nurseries where there is one which could be used as a pattern.

4. Developement of seperate area for the growing of the spruce and fir species. This area is between the dwelling and the bunkhouse and it is felt that very little work would be required to make this into a suitable area for growing of these species as they are being grown as three year seedlings. In the case of the douglas fir this species is now being grown as 3-0 stock, and engelman spruce is grown as 3-1 stock. These species are also mulched during the winter and by segregating them a more efficient job of maintenance could be done.

10. Labor Supply.

(a) Supply, suitability etc.

Work at the nursery this year was done with the aid of CCC, ERA, and regular local labor.

Local labor was used only for the transplanting work in the spring. A ten man crew was hired for the duration of the transplanting. A very excellent job was done by these men as the survival shows. If at all possible it would be well to try to hire this same crew next spring for this job. In using this kind of labor the men furnish their own transportation and come out from town every day.

The CCC from the side camp here at the nursery were used for all other work around the nursery with the exception of the fall sowing. A most satisfactory job was done on the distribution and uncovering of the fall sown beds and the work of protecting them. Weeding was done by two enrollees who were asked to volunteer for the job as most of the boys did not care for this part of nursery work and prefered to work on the road project.

ERA labor was used for the entire fall work which included fall sowing, winter protection for the seedlings, and winter protection for the transplants. We were very fortunate in securing a crew of men of exceptional capability and a most satisfactory job all around was the result. When not needed at the nursery the ERA men were employed on other jobs around the district so that men could be obtained if needed for the nursery. The only difficulty about this set up is that the men are limited to so many hours per month, and were not available after the work period ended. However, the nursery work was accomplished to take advantage of the time that the men were available.

(b) Recommended changes.

It is suggested that local labor be used entirely for the job of transplanting, and that either CCC or ERA labor be used for other phases of the nursery work.

It is also suggested that if at all possible the CCC side camp now located at the nursery be moved to some location outside the nursery area. The present setup is not entirely satisfactory from the standpoint of maintaining a neat appearance of the area. There is also a certain amount of damage to the trees and shrubs in the nursery area from the heavy truck traffic, and from the shortcuts taken in going from the barracks to the mess hall.

11. Costs.

(a) Comparison of costs by years per M trees:

Project	1938*	1937	1936	1935	1934	1933	1932	1931	**
1 Yr. seedlings	1.334	1.851	7.636	4.729	5.144	5.39	2.01	2.25	
2 Yr. seedlings	.641	1.109	6.515	5.145	3.261	6.45	2.53	11.02	
Transplants	3.67	5.223	12.836	5.959	4.835	9.15	6.59	9.54	

* See Summary sheet column 20 at end of this report.
** No previous production.

(b) Allotments by projects, Fiscal Year 1939

No allotment has been made for this fiscal year, the present plan being to run the nursery as a CCC project. If this should be discontinued on or about March 31 an allotment as shown will be needed.

First Year Seedlings	$ 200.00
Second Year Seedlings	100.00
Transplants	500.00
Distribution	400.00
Total	$ 1200.00

(c) Allotment Estimate Fiscal Year 1940

If the continued use of some form of relief labor is not possible after June 30 of this year an allotment as shown below will be needed.

Maintenance of nursery	$ 1500.00
" " improvements	50.00
" " equipement	50.00
Total	$ 1600.00

(d) Comments on costs:

Cost figures contain all sorts of labor, including CCC, ERA, and local hired labor. The local hired labor was used exclusively for the job of transplanting and the results show that it is well woth while to use a high type of labor on this particular job. A most excellent job of transplanting was done and the loss in the transplants was less than 1 %. The ERA labor was used exclusively for the fall work which consisted of the fall sowing, winter protection, and general fall maintenance. The size of the crew varied

from eight to twelve men. We were very fortunate in being able to secure a crew of exceptionally good workers. In fact the men on the crew at the time would be excellent workers on any job and it is too bad that we can't hold on to this type of workmen. If at any time in the future funds are available to hire men these men should be given careful consideration. The remainder of the nursery work was accomplished with the CCC side camp established at the nursery. It was found that the men are just as good as the foreman. By that is meant that if the foreman is interested in doing the job the men are also willing workers, but let a foreman take the don't-give-a-damn attitude and it immediately reflects on the enrollees. The foreman most suited to the work and the management of the camp was Arthur Berglund. This foreman came to the Side Camp with the first bunch of CCC and early in the summer was transferred out due to the fact that the control of the side camp was changed to another camp. At the present time this foreman is back at the nursery and it is requested that he be kept here as long as any CCC camp is here. This may sound like an exceptional amount of praise, but the fact is that there have been no less than three other foremen at the nursery between June 1 and December 1 and not one of these foremen were able to properly manage the camp.

All costs have been considerably lowered this year and it is felt that still more reductions in costs may be possible especially in the transplants if a tree digger is made available. Costs for trees to be distributed in the spring of 1939 are high due to the excessive cost of their first year, 1936. Trees to be distributed in the spring of 1940 should be considerably less, as an approximation $ 8.00, and still less the following year.

It is felt that with a production schedule of 500 M that the costs could be lowered considerably. This number could very easily be produced by producing Douglas fir as 3-0. This would cost less to produce as such and would cut the transplant job. The present area could be augmented by another area between the dwelling and the bunkhouse, and this area would be used to produce the 3-0 seedlings.

It is felt that considerable progress has been made at the Pole Mountain Nursery in the past few years both in the costs and in the production and it is felt that even more progress can be made in the future.

S
Nurseries

STATEMENT OF NURSERY COSTS

POLE MOUNTAIN Nursery, Region 2 C.Y. 1938

Projects (1)	Number of Trees M (2)	Basis for Distribution of Minor Project Costs: Man Hours (3)(a)	Animal Hours (4)	Tractor Pump Hours (5)	Auto Miles (6)	Direct Charges: Amount (7)	Per M (8)	Preliminary Distribution of Minor Project Costs: Proj. #7 (9)	Proj. #8 (10)	Proj. #8a (11)	Proj. #8b (12)	Charges Deferred to Future Years (13)	Deferred Charges from Previous Years (14)	Direct Distribution of Minor Proj. #6 (15)	Distribution of Depreciation (16)	Net Cost of Minor Projs. to be Prorated (17)	Final Proration of Minor Proj. Costs to Major Projs. (18)	Total Cost Major Projects: Amount (19)	Per M (20)
0-0																			
1st year seedlings	501.4	247½ 1174		8	52	(d)$104.80 307.06	.612		$ 2.34	$5.76		(f)$110.56	(g)$99.85	$20.70	$109.55		$ 129.16	$ 668.66	$1.334
2nd year seedlings	311.2	376½			6	104.97	.322		.27					27.13	35.14		41.44	208.95	.641
3rd year seedlings	14.8																		.641
1st year transplants	345.8	2752½(b)				651.29	1.883							58.20	256.83		302.83	1269.15	3.670
2nd year transplants	56.8	70				15.00	.264							14.11	6.53		7.71	43.35	.763
Distribution 5	220.4	350			14	103.98	.472		.91						32.66		38.52	176.07	.799
" 5A	9.5	13				10.46	1.101								1.21		1.43	13.10	1.379(k)
TOTALS		4983½		8	72	1297.56			3.52	5.76		110.56	99.85	120.14(i)	441.92(h)		521.09(j)	2379.28	
Soil Fertility Stake	.065 Mi.	152½		31	6	97.55			.27	22.32									
Motor Vehicles Pickup	.645 Mi.					113.05													
Tractors	.72 Hr.					28.08													
Pump	.073Hr.	5		174		12.70					$12.70					$ 12.70			
Administration		127½			466	102.60			20.97							123.57			
Maintenance		517			404	361.72			23.10							384.82			
Investments		2614½(c)			1003	904.59(e)			65.19			969.78							
TOTALS		3416½		205	1879	1620.29			109.53	22.32	12.70	969.78				521.09(j)			
Grand Total		8400		213	1951	2917.85			113.05	28.08	12.70	1080.34	99.85	120.14	441.92	521.09	521.09	2379.28	

(a) Includes CCC labor @ $1.50 per day, ERA labor @ $44 for 104 hours, foremens and F.O. time at actual wages, and P&A labor for transplanting @ 50¢ per hour.
(b) Includes local labor at cost of $292 for transplanting.
(c) All but 120 hours for construction of bunkhouse sewer system.
(d) Does not include cost of seed. Seed cost set up directly on line 1 of Form 351.
(e) Includes cost of constructing 120 protective frames @ 75¢ per frame and materials.
(f) Charge for 0-0 to germinate spring 1939. Deferred to 1939.
(g) Deferred from last year for 0-0.
(h) Taken from Forms 21j and distributed on basis of 4736 man hours worked on projects 1-5, which equals $0.0933 per man hour.
(i) Cost of soil fertility distributed on basis of 37,399 sq.ft. in beds, which equals $0.00321 per sq.ft.
(j) Distributed on basis of 4736 man hours, which equals $0.1100 per man hour.
(k) Difference in distribution costs due to necessity for counting, bundling, and materials of small ordres.